

ABSTRACT

A connection between a source node and a destination node is automatically routed and switched in a WDM photonic network, on receipt of a connection request. A switching and routing mechanism selects a plurality of valid link paths using a path tree, where invalid branches are eliminated based on constraints received in the connection request, and on a link and path cost functions. A regenerator placement tree is used for determining a plurality of viable regenerator paths for each valid link path. On the regenerator placement tree, non-viable branches are eliminated based on constraints received with the request and on regenerator availability at the intermediate nodes along the respective path, and on the specification of these available regenerators. Next, the switching and routing mechanism assigns a set of wavelengths to each viable regenerator path, and estimates the performance of the path using a Q estimator. The regenerator paths are ordered according to their performance and the switching and routing mechanism attempts to setup a paths to serve the request, starting with the best path.